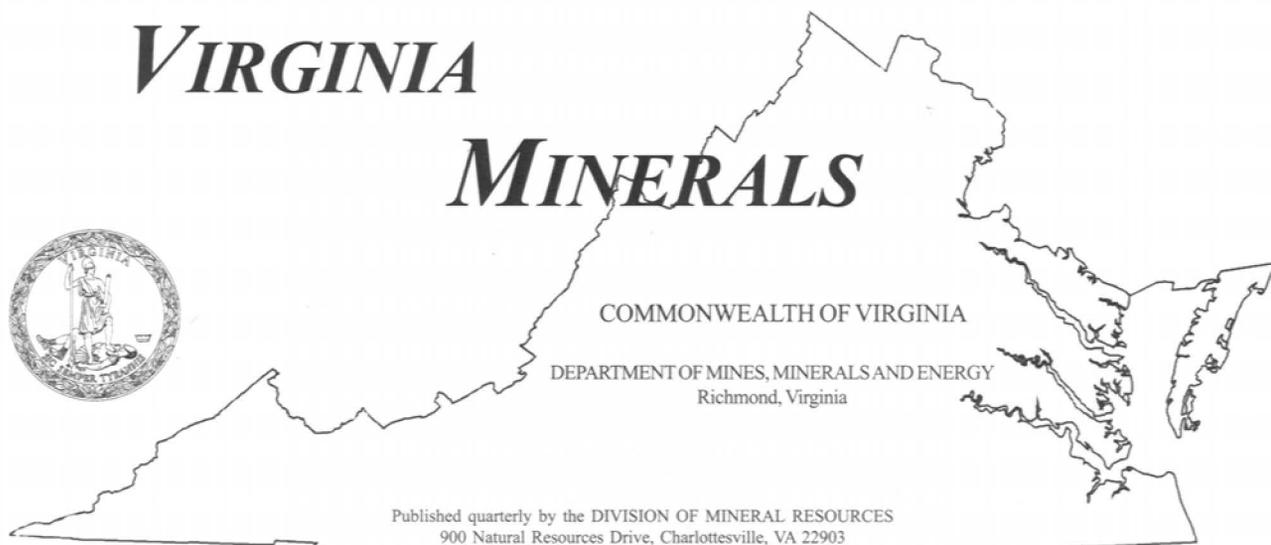


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## GEOLOGY AND HISTORY OF THE CONFEDERATE COAL MINES IN MONTGOMERY COUNTY, VIRGINIA

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### INTRODUCTION

Sunday, March 9, 1862, was a benchmark day in naval history as two of the strangest warships the world had yet seen clashed on the waters of Hampton Roads, Virginia (Figure 1). That day witnessed the first battle between ironclad vessels when the USS *Monitor* and the CSS *Virginia* (originally, the USS *Merrimac*) fought to a draw after pounding each other relentlessly for several hours. According to one account (Ellett, 1927, cited in Proco, 1994, p. 10), the Federal sailors were at a loss to understand what was propelling the rebel ship, inasmuch as no dense black smoke could be seen issuing from her stack. For many years, the story has persisted that the answer to the Yankees' befuddlement lay in the type of coal firing the *Virginia's* boilers. Rather than the bituminous coal typically used by the Confederates, the fuel for the southern vessel is said to have been a semianthracite mined in the Price Mountain area of Montgomery County in southwestern Virginia.

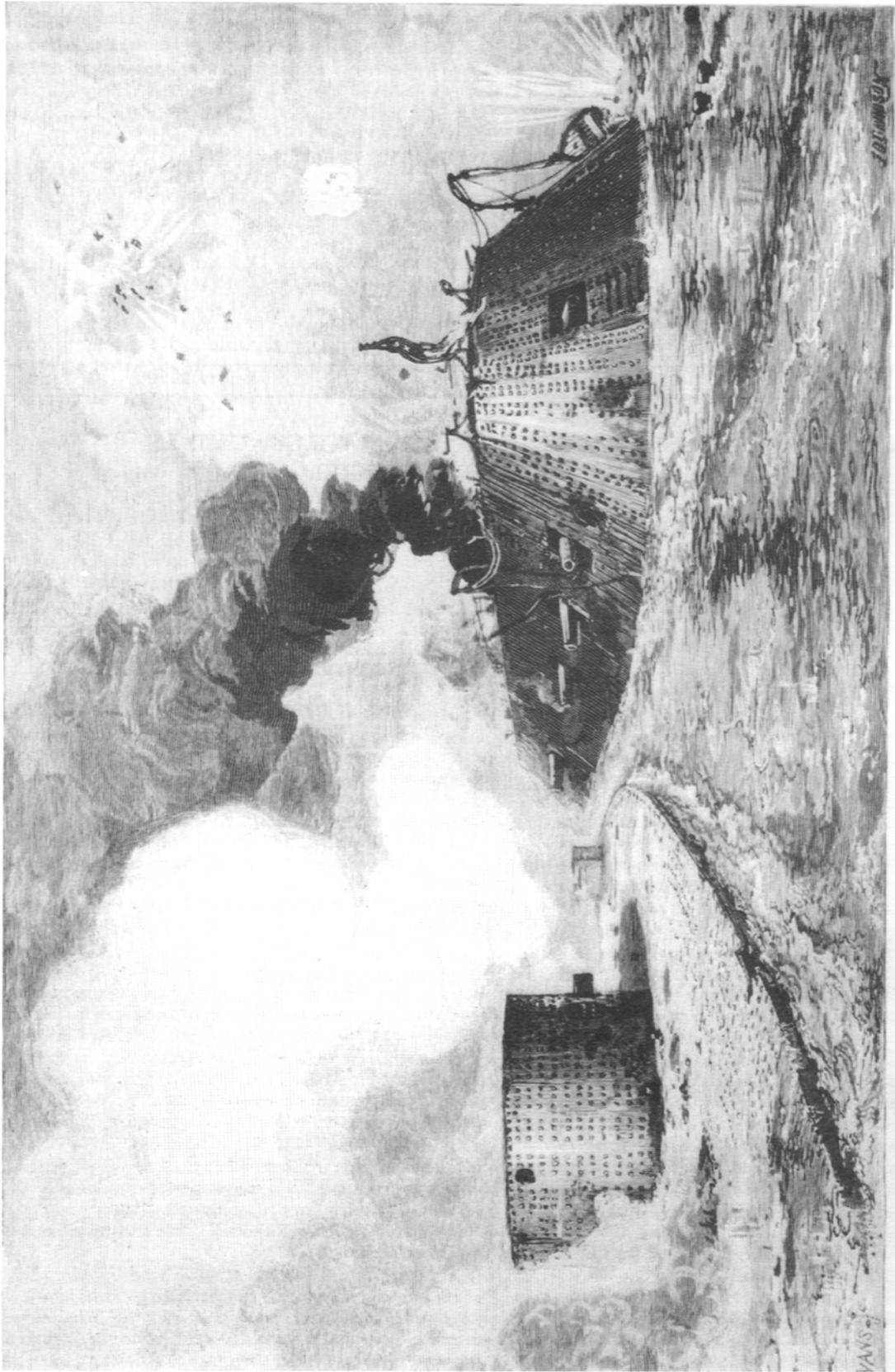
The Merrimac Coal, as this Montgomery County seam came to be called, is today recognized as one of the most geologically unique coals anywhere on the planet – it is the second-oldest coal ever commercially exploited (Butts, 1940). These Montgomery County coal measures have an equally interesting history of economic development, for their exploitation extends well back into the early days of settlement in the eighteenth century in southwestern Virginia. What special geologic conditions led to the formation of the unusually high-grade Price Mountain coals? Was this coal really being mined in remote southwestern Virginia during the Civil War, when every other coal operation in the state was located in the Richmond vicinity? And, above all, could the Merrimac coal have found its way from the mountains of Montgomery County to the bunkers of the mighty *Virginia*? This article, part of a series examining the relationships between geology and the Civil War in southwestern Virginia (Whisonant, 1996a; 1996b, 1997, 1998) attempts to answer these questions by probing the geology and economic development of the Price Mountain coal beds in Montgomery County.

### SOUTHERN COAL AND IRON INDUSTRIES: CONTRASTS WITH THE NORTH

The southern states depended on a number of mineral resources to wage war in the 1860s, the most important of which were salt, lead, niter (saltpeter), iron, and coal. In fact, extracting these materials became so important to the Confederate government that it eventually exempted from military service people who mined such strategic minerals (Hoyle, 1997). Prior to and during the war, Virginia was by far the major mineral-producing Confederate state, with most of her extensive mining operations concentrated in the western regions. Here, vast amounts of iron, lead, salt, and niter poured forth from the rich mineral belts in the western foothills of the Blue Ridge and in the Valley and Ridge beyond.

The lone exception to the concentration of mining activities in the western part of Virginia was coal. During the Civil War, the Richmond coal fields became of enormous national importance to the Confederacy because they provided virtually all of the southern coal supply (Weaver, 1962). These so-called "Midlothian mines" were located in the abundant and relatively easy-to-mine bituminous coal measures just west of the Confederate capital. At their peak during the war, the Richmond coal fields produced over 100,000 tons annually (Hibbard, 1993), much of it destined for the strategically critical Tredegar Iron Works. The Midlothian mines and Tredegar constituted the industrial heart of the Confederate war machine, prompting some historians to speculate that defense of these vital industries was a significant factor in moving the southern capital from Montgomery, AL, to Richmond shortly after the outbreak of hostilities (Crews, 1992).

A major geological difference existed between the coal resources of the northern and southern states that had a profound impact on the growth of heavy industry prior to the war – that difference was anthracite (Hoyle, 1997). Northeastern Pennsylvania contains about 75 percent of the world's anthracite (hard coal) deposits. This high-energy industrial fuel powered the "hot blast" method of making pig



THE "MERRIMAC."

THE ENCOUNTER AT SHORT RANGE.

THE "MONITOR."

Figure 1. USS *Monitor* (left) and CSS *Virginia* engage in world's first battle between ironclad warships (courtesy of the Library of Virginia). The rebel vessel was originally the USS *Merrimac*, a steam frigate burned and scuttled by retreating Union forces. Resourceful Confederates raised, armor plated, and rechristened her the *Virginia*.

iron, which in the pre-war years resulted in a major relocation of the American iron industry to Pennsylvania where it grew rapidly. Spin-off industries such as railroads and massive facilities at New York Harbor and Philadelphia quickly developed; for example, five important "anthracite railroads" were operating in the North by the time of the Civil War.

In contrast to the North, that region destined to become the Confederacy, with the notable exception of Virginia, had a poorly developed antebellum coal and iron industry. Wood was plentiful, and southern ironmasters preferred the charcoal-fired ("cold blast") technology for producing pig iron. Even in the Old Dominion, where a thriving coal and iron industry had grown up before the war, the iron furnaces were fueled almost exclusively with wood. (Interestingly, Virginia's only coke-fired (hot blast) furnace, the Potomac Furnace in Loudoun County, fell into Union hands at the very outset of the conflict.) Although charcoal furnace-produced iron was of very good quality (Bruce, 1930), such furnaces were of small capacity and limited efficiency. Conversely, the anthracite and coke-fired furnace had at least twice the capacity and was far more efficient than the charcoal operation. Thus, the fundamental geological inequity of the world's most extensive anthracite deposits being located in the northeastern United States played a major role in creating a burgeoning 1860s industrial superpower. Ultimately, the Confederacy, with its significantly inferior development of skilled laborers, raw materials, manufacturing capacity, and transportation network, found it could not compete with the northern economic behemoth.

**GEOLOGY OF THE MONTGOMERY COUNTY COAL MEASURES**

Virginia's coal resources are found in three distinctly different geologic regions – the Mesozoic Basins, Valley and Ridge, and Appalachian Plateaus (Figure 2). The first commercial coal mining began in Virginia (and the United States) in 1748 in the coal fields located in the Richmond Mesozoic Basin (Wilkes, 1988). Settlers spreading westward across the state soon encountered the Valley coal fields in the eastern Valley and Ridge. Mining of these Mississippian-age coal seams began in the late 1700s. The last coal resources to be developed, and the only areas still in production, are the Southwest Virginia fields in the Plateaus region. Extensive reserves of Pennsylvanian-age coal in this province have been exploited since the 1880s.

The Confederate coal mines of Montgomery County are part of the Valley coal fields belt. Geologists have long been interested in the Valley coals, thanks to their great geologic antiquity, unusually high grade (semianthracite), and occurrence in a major fold-thrust province. As early as 1835, Virginia State Geologist William B.



Figure 2. Physiographic provinces of Virginia and areas mined for coal (from Bird, 1997). No coal is currently being mined in the Valley fields or in the Richmond Basin.

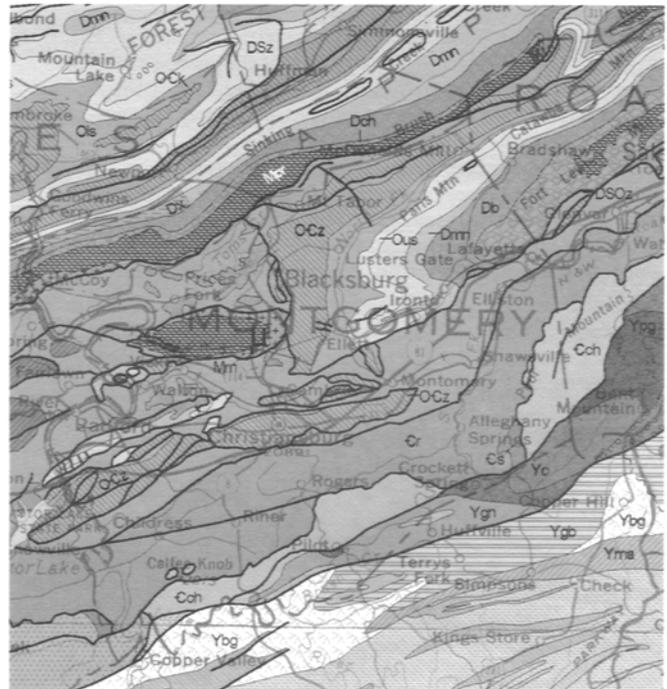


Figure 3. Geologic map of the Montgomery County area (Virginia Division of Mineral Resources, 1993). Cross-hatched pattern (Mpr) indicates the Mississippian Price Formation that contains the coals described in this article. Northern strike belt is Brush Mountain, elliptical area is Price Mountain. Star indicates location of Merrimac mines area.

Rogers called attention to the "recent discovery . . . of a semi-bituminous dry coal . . ." along the Brush Mountain trend in Montgomery County (Rogers, 1835, cited in Worsham, 1986, p. 150). Rogers believed that this coal would spur iron production. After the Civil War, late 1800s geologists C. R. Boyd and Jed Hotchkiss frequently mentioned the "anthracite" deposits in their writings (see, e.g., Boyd, 1880; Hotchkiss, 1892). Around the turn of the century, Campbell (1894) and Watson (1907) provided relatively modern geologic descriptions of the coal in this district. Campbell and others' 1925 monograph is by far the most comprehensive geologic study of the Valley coal fields yet published; nearly all succeeding workers have used their geologic and geochemical data. Of the later studies, Burkhart (1927), Butts (1940), Bartholomew and Lowry (1979), Stanley and Schultz (1983), and Bartholomew and Brown (1992) contain much useful information on the Montgomery County coal measures. Kreisa and Bambach (1973) presented the most detailed analysis of the environmental conditions under which the coal-bearing strata formed. The following account of the Montgomery County portion of the Valley coal fields is taken from these sources.

All of the coal-bearing Mississippian strata in Montgomery County are located on the Saltville thrust sheet and crop out in two major areas – a belt trending northeast-southwest along the base of Brush Mountain and in the elliptically-shaped Price Mountain area (Figure 3). These coal seams (as well as the others in the Valley fields) have been more deeply buried and intensely deformed than those in the other geologic provinces. As a result, they are of a low volatile bituminous to semianthracite rank – the highest coal grade in the

state. Coals metamorphosed to this degree may generate significant amounts of methane and display pervasive tectonic shattering. The large quantities of methane, although perhaps constituting a fuel resource for the future, create dangerously gassy mines that have experienced tragic explosions in the Pulaski and Montgomery Counties region. Moreover, the intense tectonic deformation creates formidable mining conditions in that the coal seams are difficult to follow and the mine walls and roofs are inherently unstable. In spite of the daunting geology associated with mining the Valley fields, many attempts to extract the coal have been made. In the Price Mountain area alone, Bartholomew and Lowry (1979) show 181 mines and prospects that were active at one time or another. Figure 4 shows some of the major historic coal mining sites in the Montgomery County region.

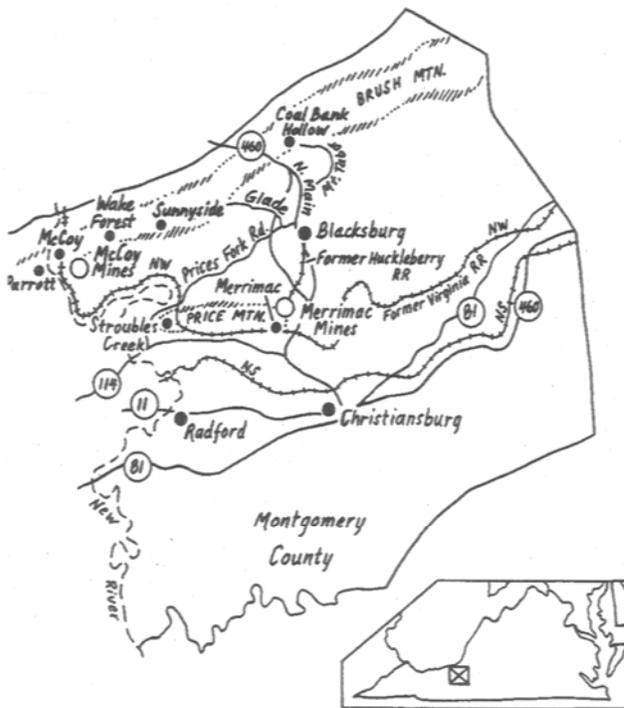


Figure 4. Map showing some important coal mining locations in the Montgomery County area (used with permission of Mary La Lone and Pocahontas Press, Inc.) Smaller darkened circles are major mining sites. Note presence of Merrimac mines in Price Mountain area.

The Confederate coal operations in Montgomery County were located in the Price Mountain district, which is part of a large (roughly seven miles by two miles) thrust window created during the Alleghanian Orogeny near the end of Paleozoic time. Along the axis of the Price Mountain anticline, lower Paleozoic carbonates and shales have been eroded away to reveal the Mississippian beds beneath the Pulaski thrust fault. The geologic unit containing the coal beds is the Price Formation (Figure 5), named by Campbell (1894, p. 177) for the Price Mountain exposures. The Price was deposited during early Mississippian time (approximately 350 million years ago), making the coals very old geologically.\* The Price coals are thought to be the oldest commercial coals anywhere in the world except for the Devonian coals of Spitzenberg; they are the geologically oldest coals ever mined in North America.

\*Although coal beds as old as Precambrian are reported, they become abundant in the geologic record beginning in the upper part of the Devonian. Then, rapidly evolving land plants established vegetative masses large enough to make coal preservation a common event.

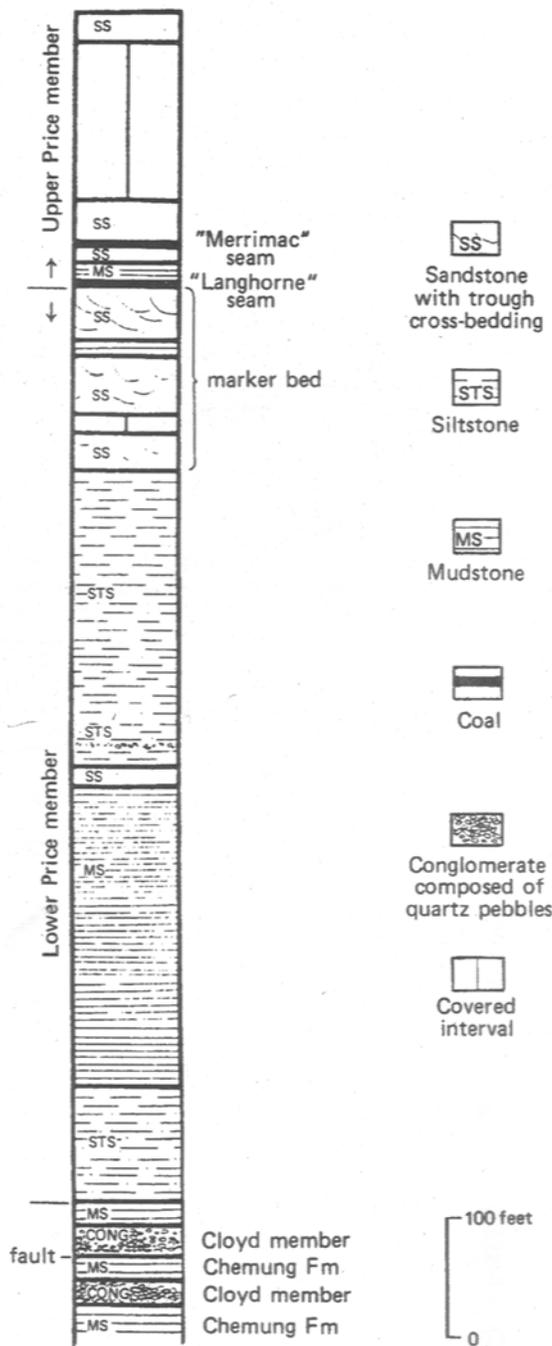


Figure 5. Stratigraphic column of the Price Formation at the reference section, State Highway 100, Pulaski County, VA (from Bartholomew and Brown, 1992; after Bartlett, 1974). This locality is about 15 miles west of the Price Mountain area in Montgomery County.

The Price Formation is part of a great Devonian and Mississippian clastic sequence in southwestern Virginia derived from Acadian source terrains to the southeast. The depositional environments of the Price are generally interpreted as mixed marine and nonmarine conditions typical of the deltaic model of coal formation. The basal member of the formation, the Cloyd Conglomerate, is an especially

interesting deposit (Figure 5). It contains unbroken brachiopod and pelecypod shells within the quartz pebble layers that make up most of the member. This unusual association of intact shelled invertebrates and a coarse-grained conglomerate (some of the pebbles are several cm. in size) suggests that the marine creatures lived as an in-place benthic community in a turbulent environment.

Another interesting aspect of the Cloyd conglomerate is its historic use as grinding wheel millstones. A number of quarries existed in the Cloyd on the southeast slope of Brush Mountain during the nineteenth and twentieth centuries. Some of the Cloyd millstones were hauled by wagons into the Blue Ridge where they ground grain at places such as Mabry's Mill in Floyd County, located on the present Blue Ridge Parkway.

Above the Cloyd, several thin coals occur within the upper Price (Figure 5). Only two of these coals are thick enough to have been developed commercially. Initially, these were known as the Big Seam and Little Seam (the latter a smaller underlying unit), but Campbell and others (1925, p. 145) renamed them the Merrimac and Langhorne, respectively. In the Montgomery County area, the Merrimac interval is five to 12 feet thick and the Langhorne is one to three feet thick<sup>1</sup>. In the Price Mountain structure, only the Merrimac is thick enough to have been worked commercially; thus, the Civil War coal operations that existed on the southeastern slope of the mountain must have been in the coal seam ultimately named for the rebel ironclad.

#### PRE-CIVIL WAR HISTORY OF THE MONTGOMERY COUNTY COAL MINES

No one knows exactly when coal was first discovered and mined in the Montgomery County area. Price (1994, p. 1) reported that the first records of coal discovery appeared around 1750; simple open-pit mining may have begun as early as 1770 (Freis, 1996). A fascinating story (perhaps apocryphal) is that the Valley fields coal industry was started by foreign mercenary soldiers (Burkhart, 1931; Proco, 1994). According to these accounts, mining of the Valley coal began in Montgomery County during or shortly after the Revolutionary War. In one version, the coal was discovered by a regiment of Hessian prisoners of war held in the area to avoid recapture by the British. Among these soldiers were men who had been coal miners and iron smelters, hence development of the coal commenced. A slight variation of the story is that Hessian prisoners voluntarily came to the Montgomery County area with Colonel William Preston after the Revolutionary War. By the 1790s, a Hessian named Jacob Broce seems to have been operating a coal mine, iron smelting works, and a rifle barrel boring mill along Slate Branch Creek in the Merrimac area (Burkhart, 1931; Hibbard, 1990; Proco, 1994; Worsham, 1986). Pit mining also occurred around this time at the foot of Brush Mountain in the Price coal seams exposed along Toms Creek.

Throughout the late 1700s and early 1800s, small scale mining of the "stone coal" (an early name for the Valley semianthracite) occurred at Merrimac and other sites in Montgomery County. Most of this coal was used by local iron smelters, blacksmiths, and farmers. These earliest mines were surface diggings, but eventually coal extraction shifted to underground drift and slope mines (La Lone, 1997). (A drift mine is a shaft dug on a horizontal level, whereas a slope mine follows the inclination of the coal seam at a downward angle. Slope mines came to dominate mining in the Price Mountain area

because of the tectonic deformation of the coal.) An 1833 map by James Herron (cited in Worsham, 1986, p. 150) showed coal mines on Brush Mountain and along Slate Branch in the Price Mountain vicinity. In 1840 the U.S. census officially reported 200 tons of coal production in Montgomery County.

The remoteness of the Valley coal greatly hindered the growth of this industry in the first half of the nineteenth century. No railroads existed in the region, thus horse-drawn wagons carried the coal, a very costly means of shipment (Proco, 1994). But interest in the Montgomery County fields soared in the 1850s when the Virginia and Tennessee Railroad at last was extended through the county. During this decade, four major coal companies arose, the most notable of which was the Price's Mountain Coal Mine Company. This corporation evidently survived into the Civil War years and may very well have operated the mine from which the Confederate government obtained coal.

The Price's Mountain Coal Mine Company was incorporated on April 11, 1853, and consisted of three partners – Jeremiah Kyle, W. M. Montague, and W. D. Kyle (Worsham, 1986). This enterprise was generally referred to as "Kyle and Montague," and this is its listing in the U.S. industrial census of 1860. In that year, the company output dwarfed all other Montgomery County coal operations, producing 2,857 tons of coal valued at \$11,200. No other county mine extracted coal worth more than \$500. Proco (1994, p. 8) cites an account of the mid-1800s mining activities on Price Mountain, including those of Kyle and Montague:

"Prior to the Civil War [the coal] had been used for blacksmith and smelting purposes to a limited extent. Mr. Jeremiah Kyle, who was a very prominent merchant residing in Christiansburg became interested in the coal and brought some Welsh miners from Wales who drove three slopes at different points on the outcrop of the coal for a distance of about 400 feet. These slopes were put down for the purpose of proving that the coal was regular and it was not a pocket as was asserted by some geologists at that period. After these slopes were driven, a Company was formed for the purpose of building a railroad from the mine to Christiansburg in order to have transportation facilities."

That railroad was not built, and indeed all work was suspended as armed conflict between North and South broke out in 1861. But important times lay ahead for Price Mountain coal, times that included wartime mining for the Confederate government.

#### CIVIL WAR HISTORY OF COAL PRODUCTION IN MONTGOMERY COUNTY

The story that a Price Mountain coal mine supplied the fuel for the CSS *Virginia* is deeply ingrained in southwestern Virginia lore. We may never know definitively whether this occurred or not. The existence of a Price Mountain coal operation by or for the Confederate authorities is substantiated by an 1864 Confederate Engineer's map of Montgomery County that shows a "Govt Colliery" about a mile southwest of the present-day community of Merrimac (Figure 6). (A colliery is a chiefly British term for a coal mine.) This might very well be the Kyle and Montague mine, but no official records have been found that specifically name the owners of the Confederate mine. Nor has documentation emerged that indicates where this coal went or how it was used. Many years after the war, the tradition developed that Price Mountain coal indeed powered the southern ironclad. The account below is a compilation and analysis of the most widely quoted sources of this tradition.

The Kyle and Montague mine on Price Mountain apparently operated into the Civil War years, although activity may have stopped

<sup>1</sup>These figures are misleading. The coal-bearing intervals actually consist of three different materials – the true coal, intervening waste rock, and impure coal (or coaly rock) with ash content. In miners' parlance, the latter two are called "slate" and "bone," respectively. In Montgomery County, Stanley and Schultz (1983, p. 10) reported a 10.75 ft. thick-Merrimac coal sequence containing six separate coal beds that totaled 6.7 ft. in thickness.

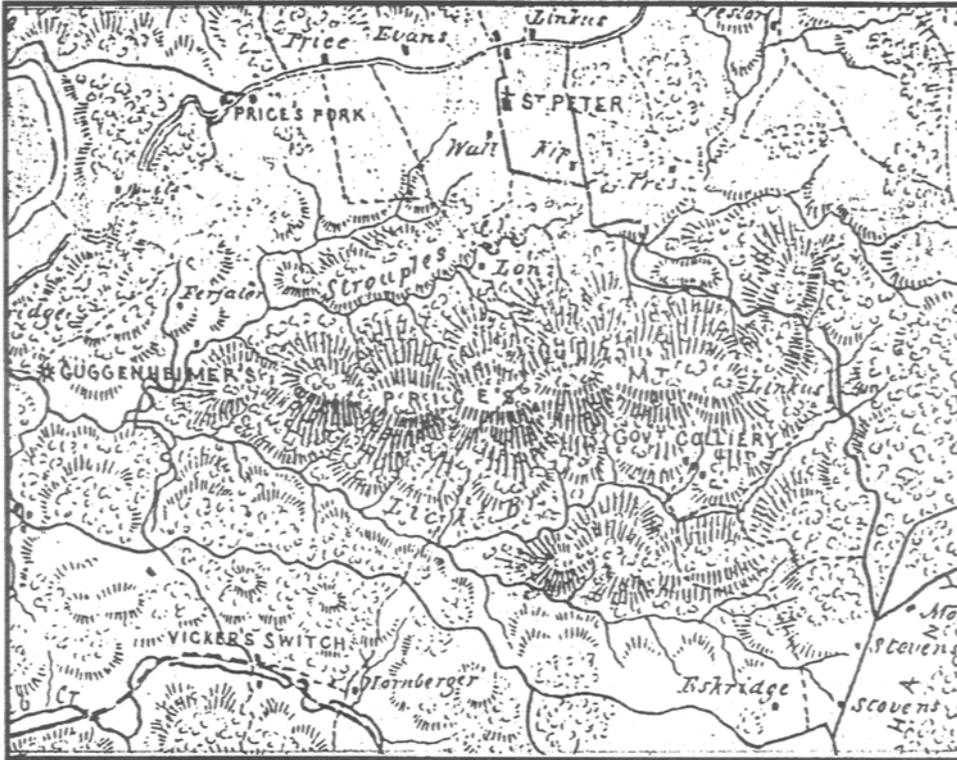


Figure 6. Detail from the 1864 Confederate government map of Montgomery County (used with permission of Garland Proco). Note location of "Govt Colliery" on southeastern side of Price's (sic) Mountain.

temporarily at the outbreak of hostilities in 1861. Mine company partner William Montague recalled in 1894 (cited in Worsham, 1986, p. 155) that during the war his mine produced coal for the manufacture of salt kettles and also for the making of shot and shell at Howardsville in Albemarle County for the Confederate Army. According to Burkhart (1931, p. 1), a "fair sized mining camp was built [in the Merrimac vicinity], and under the direction of I. W. Adams of Lynchburg, the Confederate government mined coal for use in the southern war area." Burkhart went on to say that "coal from this mine supplied the *Merrimac* . . . and it was from it that the mining camp and the coal seam were named."

Pierce (1930) wrote an account of the *Monitor* and *Merrimac* encounter based on the observations of a survivor of the historic battle. In this article, Pierce (1930, p. 386) noted that the Confederate government took over the Merrimac mine during the war and produced great quantities of coal. The coal was sent by wagon to Buchanan, VA, where it was loaded onto canal boats and floated down the James River to Norfolk "to furnish steam for the iron-clad."

One of the most detailed descriptions of the Civil War operations of the Merrimac mine was provided in a 1927 personal letter (cited in Proco, 1994, p. 10) written by Mr. Guy Ellett, a Montgomery County resident. Ellett's father was a Confederate colonel and medical doctor. Ellett wrote as follows:

"About this time the Civil War broke out and all work was suspended. The only coal at the time of the outbreak of the Civil War that was being operated in the South was at the coal basin near Richmond which is situated in Chesterfield and Powhatan Counties in this State. After the Federals occupied that territory it was impossible to mine any of that coal for manufacturing purposes and after the Merrimac, which had been sunk in Norfolk harbor and the Navy yard was destroyed, it was raised and re-modeled and re-

named the Virginia, there was then the problem of securing fuel to feed the boilers of this vessel and this problem was up to the officers of the Confederate Navy and they had heard of the coal deposit in Montgomery County and upon investigation they employed Mr. I. H. Adams, now deceased, but formerly head of Adams & Payne in Lynchburg and of Adams, Payne & Gleaves in Roanoke, to manage the coal operation which would supply the coal necessary to feed the boilers of the man-of-war, Virginia. Mr. Adams told the writer that he and his family moved to the mine and at that time there were some 40 or 50 houses with a very good mining plant with bunkers and mechanical hoists on the property which had been placed there by the Welsh miners when they were proving the coal seams; that he filled these houses with miners and had quite a large production per day at that time; that for transportation they hauled the coal by six mule teams to Christiansburg

where it was shipped in cars to Norfolk and placed in the bunkers of the man-of-war. I think if you will refer to a book written by Mary Johnston, I do not recall the name, she mentions this fact in her book and states that the coal that was burned on the Virginia came from far-away Montgomery County."

The ultimate fate of the Price Mountain coal operations during the war years is unclear. Some sources (e.g., Burkhart, 1931) indicate that Union soldiers under General William Averell raided the coal facilities in 1864 and destroyed the mines. Others (e.g., Ellett, 1927, cited in Proco, 1994, p. 10) claim that General George Stoneman's troopers devastated these operations. Both Federal generals led forces through the Montgomery County region late in the war, but neither mentions the destruction of any coal mines in his official report. Indeed, no Union or Confederate official reports or any contemporary newspaper articles speak of Merrimac or the destruction of the mines and mining village there (Worsham, 1986). Montague made no mention of any Federal raids in his 1894 remembrances. (Interestingly, Montague made no reference to his coal fueling the *Virginia*, either.) Perhaps, like many other southern industrial activities near war's end, the Price Mountain coal operations diminished or ceased altogether as manpower shortages became acute and war fatigue set in.

Four decades after the war, the area around Price Mountain was named "Merrimac" when large-scale mining operations began about 1902 (Freis, 1998). At this time, the story that the Merrimac mine had supplied the *Virginia* was widely circulated by the Virginia Anthracite and Coal Company, then owner of the mine (Worsham, 1986). Did Montgomery County Coal provide the fuel for the historic Confederate armored warship? The question remains unanswered.

## EPILOGUE

Following the Civil War, coal mining in Montgomery County resumed but production was low. Mines remained far from the main railroad line (by then, the Norfolk and Western) and this seriously limited growth of the industry. Marketing efforts received another setback when the Norfolk and Western completed a railroad to the Pocahontas Mine in Tazewell County in 1883 (Proco, 1994). This bituminous coal was plentiful, easy to mine, and now readily transportable to the big eastern markets; Merrimac mine sales to these important consumers fell sharply.

In the first decade of the twentieth century, demand for the Valley semianthracite surged. This was due in part to a major strike by Pennsylvania anthracite miners, but completion at last of a railroad network within Montgomery County helped also. In 1904, the Virginia Anthracite Coal and Railroad Company, by then operators of the Merrimac facilities, completed a railspur that connected Blacksburg via the Merrimac mine with Norfolk and Western's main line through the county. (This quaint rail line became known as the "Huckleberry Line" because students at Virginia Polytechnic Institute (VPI) had time to leave the slow-moving train, pick the wild berries, then reboard (Hibbard, 1990). Students from VPI continued to use this train until its last run in 1958.) A second railroad, the Virginian, was completed through Montgomery County in 1907 from West Virginia to Norfolk. Coal from the Merrimac mine was loaded onto this line and shipped to Hampton Roads. Spurred by the increased availability of transportation to more distant markets, the semianthracite operations throughout the Valley fields continued to grow.

Disaster struck the Merrimac mine in 1909 when a heavy rainstorm flooded the shafts and forced closure until 1918. Reopened that year, the Merrimac operations reached their peak during the 1920s and 1930s. A thriving community developed around the mine, including a commissary, post office, hotel or boarding house, and about three dozen company houses (La Lone, 1997). In 1934, a county-wide strike by the miners closed the largest operations, including the Merrimac mine. Following the strike, the Merrimac resumed production but closed again and went out of business permanently in 1935. Coal mining continued elsewhere in the county, and production reached its historic peak in 1943-1944 when Montgomery mines produced over 200,000 tons of coal (Hibbard, 1990). Eventually, large scale mining in the county ceased in the late 1950s, although small truck mines operated sporadically in the Brush and Price Mountains area into the 1960s and 1970s.

No coal mining occurs anywhere in the Valley fields today. In Montgomery County, only one marker, a monument to honor the memory of 12 people killed in the tragic 1946 explosion in the Great Valley Mine in the Brush Mountain area, serves to commemorate the 200-year history of the county mines. At Merrimac, a few ruins offer evidence of that mine's proud past; however, a Coal Miners Park at this site is in the planning stage. One last operation during the late 1980s reclaimed limited amounts of coal from the waste piles at the old Merrimac mine. This material was cleaned in a shaker and shipped to a North Carolina charcoal briquette operation (Hibbard, 1990). From the bunkers of the mighty *Virginia*, perhaps, to backyard barbecues – thus slips the legacy of the Confederate coal mines of Montgomery County into the mists of history.

## ACKNOWLEDGEMENTS

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